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BOTRYTIS AS A PARASITE UPON CHRYSANTHEMUMS AND POINSETTIAS.*

BY PERLEY SPAULDING.

During the month of November, 1904, one of the smaller greenhouses at the Missouri Botanical Garden was devoted entirely to chrysanthemum plants which were just beginning to come into bloom. Because of lack of room they were badly crowded together, but especial pains were taken to have the conditions as favorable as possible for the plants. The taller ones, located in the middle of the house, came into bloom first, and it was noted almost at once that the flowers were affected by some disease which attacked the petals. The trouble soon spread to the lower plants as they came into bloom, and the disease was very shortly scattered over the house. So far as observed, the trouble always first appeared on the petals. The diseased flowers were picked as soon as they were seen to be affected, so that the fungus did not have a chance to infest the other portions of the plants; for this reason it cannot be said that the fungus might not have attacked other parts of the plants if it had been left to run its course.

The disease first appeared as tiny, watery, discolored spots, looking as if the petals had been pricked with a needle; this, of course, showed much plainer on the white flowers than on the colored ones (pl. 32, above). These spots were generally more or less numerous on single heads, and even on individual petals; they were often located only on one side of the head, showing that the infection had come from some point on that side of the plant. They very rapidly grew larger, and by the time the affected spot extended over a fourth of the petal, the diseased tissues wilted and dried up. Naturally the tips of the petals were first attacked, and they died down to the base as the disease progressed in its course. Very soon after they began to dry, a grayish brown velvety growth appeared upon them (pl. 32, below). This was at once perceived to be composed of the fruiting bodies belonging to *Botrytis vulgaris.* These fruiting bodies were formed within about two days after the beginning of the attack. If allowed to run its course, the disease invariably attacked every ray of the affected head, and in the last stages of disease the affected head was simply a mass of dried rays hanging from the stem, and permeated with the mycelium of the fungus, while all over the outside were the fruiting bodies crowded thickly together.

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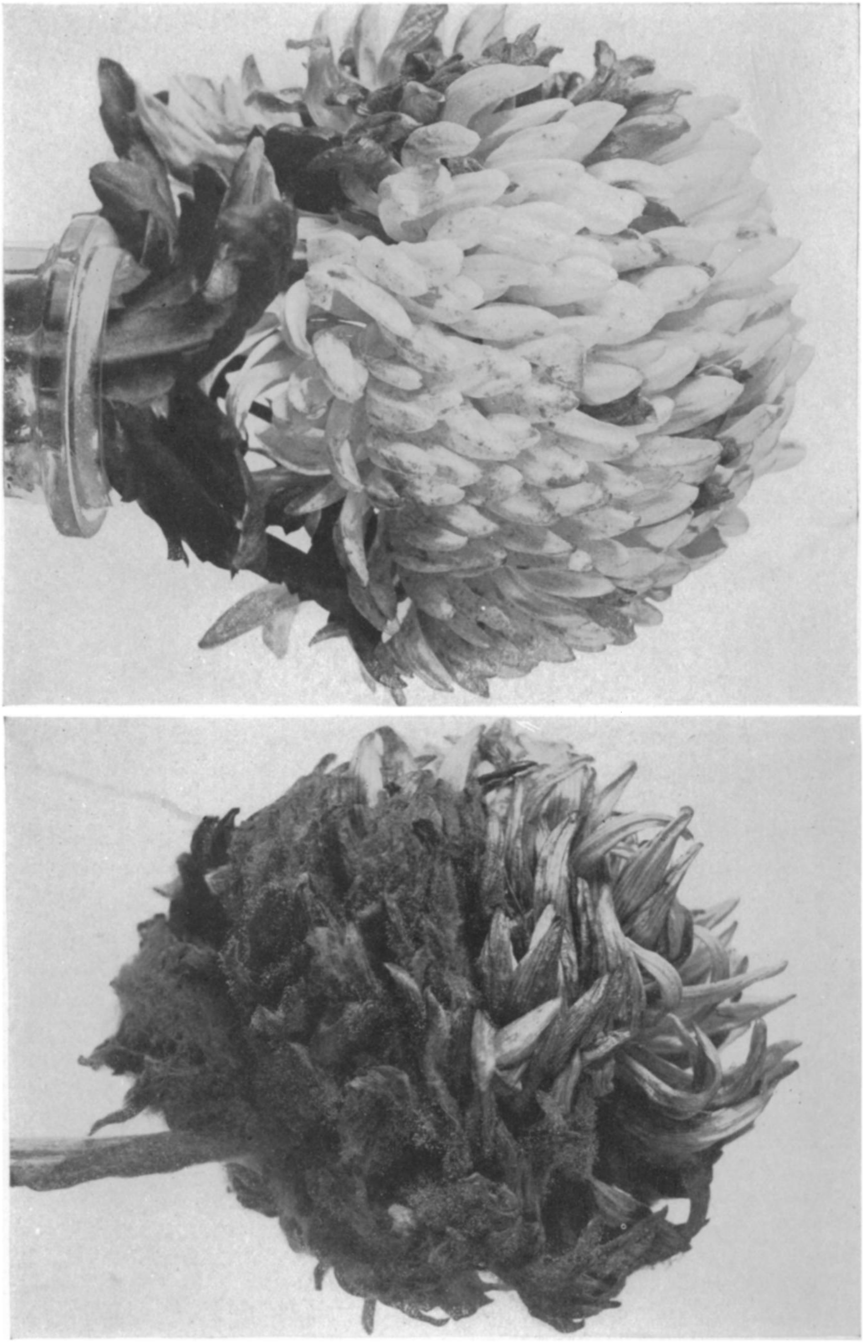
After the first few flowers became affected, the disease spread very rapidly and caused considerable damage. Many of the finest blooms had to be removed as soon as they opened, thus defeating the purpose for which they were raised. The fungus, so far as could be determined, seemed to exhibit no partiality toward any one variety and counts showed that no one color of blossom was more often attacked than another. During the next two years, at about the same period, in the growth of chrysanthemum plants exhibited by the Botanical Garden, the disease has occurred in varying intensity. The first season it started earlier in the development of the flowers than it has since done, and for that reason, caused a greater amount of damage than at any other time. During the months of November and December, 1906, a Botrytis disease of "poinsettias" *(Euphorbia pulcherrima)* was noted in the same house in which two years before had occurred the above mentioned Botrytis rot of chrysanthemum petals. In this case the fungus attacked the slightly projecting angles on either side of the leaves. It did not attack the red, bright colored leaves at the top of the plants, but only the green, broad leaves which grow along the stem below the red ones. The disease first appeared as a slightly deadened area at the very tip of the angles, which showed beneath tiny white drops of the hardened juice along the larger veins. The fungus seems to attack the tissues in such a way that the white juice of the plant finds exits and exudes through these weakened spots, hardening quickly upon being exposed to the air. These small, hardened drops of juice seem to be very characteristic of this disease upon this particular plant, it being found to occur constantly only in connection with this trouble; the very earliest stages of the disease could be found only by looking at the under sides of the leaves, and noting the presence of this dried juice at the angles of the leaves. In the earliest stages the leaf tissues upon the upper side gave little or no indication of being diseased, although there usually was a slight yellowish discoloration. As the disease progresses the affected area becomes larger and the extreme tips of the affected angles wither and become discolored; this dying of the tissues progresses toward the mid rib of the leaf as the fungus extends its field of action. In no case, however, did the Botrytis disease alone seem to extend over the whole area of the leaf. On the other hand, after the disease had progressed until it involved about one-fourth the area of the leaf, the effect seemed to be communicated to the petiole, and the leaf was prematurely shed. In this way considerable damage was done by the fungus, since the badly affected plants consisted only of a bare stem surmounted by the broad whorl of red leaves at the top. The absence of the green leaves greatly marred the plants for exhibition purposes. About two days after a leaf is first attacked, the characteristic fruiting bodies of Botrytis are formed in thick groups, clothing the under surface of the affected area.

In the same greenhouse a number of plants of *Primula obconica grandiflora* were found to have the lower leaves also diseased by Botrytis. These plants were in very poor condition, being very short-stemmed, so that the lower leaves lay flat on the surface of the soil, thus giving the fungus the best of opportunities for attack. In this case the affected leaves finally entirely succumbed to the disease, and it even spread from the diseased ones on to the adjacent healthy ones.

These instances indicate the parasitism of Botrytis upon the leaves and petals of the above mentioned plants. No experiments were made to prove the parasitism of the fungus, but considering the present state of our knowledge of this very point, we may well consider this fungus one of the very worst, under certain conditions, with which the gardener has to contend. The writer has seen little or no mention of diseases caused by Botrytis in this country, although this class of trouble seems to be well known upon the Continent. Because of the very slight mention which has been made of diseases of this kind, it has seemed advisable to give a rather extended account of the above cases as noted by the writer.

EXPLANATION OF PLATE.

Plate 32.—Chrysanthemums affected by Botrytis. Above, an early stage of the disease in which some flowers are spotted and a very few bear the fruiting fungus. Below, a later stage, in which the fungus is in full fruit.



BOTRYTIS on CHRYSANTHEMUMS.